ACCELERATED LEARNING PROGRAMME (ALP)
LAHORE, SAHIWAL, GUJRANWALA, FAISALABAD, MULTAN, BHAWALPUR,RAWALPINDI , DERA GHAZI KHAN, AZAD KAHSMIR , SARGODHA

11th CLASS PHYSICS GUESS PAPERS

CHAPTER NO. 1 MEASUREMENTS

SHORT QUESITON:

1. What is meant by the term precision? Explain briefly with an example.
2. If a precise measurement is also an accurate measurement. Explain your answer.
3. What are the dimensions and unit of gravitational $F = GmM/r^2$.
4. Write the dimensions of viscosity and angular velocity.
5. Show that the famous "Einstein equation" $E = mc^2$ is dimensionally consistent.
6. What is physical significance of dimension of physical quantity?
7. Calculate the distance covered by the light in free space in one year.
8. Write down the two uses of dimension analysis.
9. Does a dimensional analysis give any information of constant of proportionality that may appear in an algebraic expression? Explain

LONG QUESTIONS:

1. Suppose use are told that acceleration of a particle moving in a circle of radius r with uniform speed v is proportional to some power of r say and some power of v say V. Determines the power of r and V.
2. The speed V of sound waves through a medium may be assumed to depend on i) The density p of the medium ii) Its modulus of elasticity E which is the ratio of sizes to strain. Deduce by the method of dimension, the formula for speed of sound.

CHAPTER NO.2 VECTORS AND EQUILIBRIUM

SHORT QUESTIONS:

1. Define the terms : 1) Null Vector ii) Subtraction of vector
2. If two perpendicular vector have same magnitude, find the angel between their sum and difference.
3. Write down the steps for addition of vectors by rectangular component method.
4. Name three conditions that could make 'A. 'B = 0
5. What is a unit of vector? How can it be obtained?

6. Can you add zero to a Null vector
7. Show the sum and difference of two perpendicular vectors of equal lengths are also perpendicular and of the same length.
8. How would the two vectors of same magnitude are oriented such that resultant vector has magnitude equal to each vector.
9. Can the product of two vectors be equal to the product of their products of their magnitude?
10. What is scalars and vectors? Give example
11. Two vectors of magnitude 10 each making angle 180 o with each other. Find the magnitude of their resultant.
12. If A = 4i – 4j what is the orientation of A.

LONG QUESTIONS:

1. EXAMPLE NO. 2.5
2. Explain cross product or vector of two vector state right hand rule and give at least four characteristic.
3. Define vector product or cross product. Explain with right hand rule and give four characteristics of cross product.
4. NUMERICAL NO. 2.6
5. NUMERICAL NO. 2.15

CHAPTER NO. 3 MOTION AND FORCE.

SHORT QUESTIONS:

1. Define Elastic and inelastic collision.
2. When rocket re-enters the atmosphere, its nose becomes very hot, why?
3. Is the range of projectile same for both angles of projectile of 30^{o} and 60^{o}? If your answer is yes than prove it?
4. State law of conservation of momentum and write down its mathematical form.
5. Define projectile motion and derive the expression for the range of projectile?
6. At what point or points in the path does a projectile have its minimum speed, its maximum speed?
7. Can the velocity of an object reverse the direction when acceleration is constant? Explain
8. Define isolated system with an example?
9. Water flows out from a pipe at 5 kgs-1 and its velocity changes from 4 cm-1 to zero on striking the wall. Find the force exerted by the water on the wall?
10. When rocket re-enters the atmosphere, its nose becomes very hot, why?

11. What is the meant by Projectile motion? Derive an expression for time of flight?
12. Show that the rate of change of momentum is equal to force.
13. When a bullet is fired from a rifle why does the rifle move back word. Discuss it with reference to momentum.
14. A 15000 kg has its velocity reduced from 20 ms-1 to 15 ms-1 in 3.0 sec. How large was the regarding force.

LONG QUESTION:

1. State and explain the law of conservation of linear momentum.
2. What is projectile? Derive expressions of the i) Maximum Height ii) Horizontal range.
3. Find angle of projection of a projectile for which its maximum height and horizontal range are equal.
4. Define Elastic and Inelastic collision. Discuss elastic collision in one dimension and show that velocity of approach is equal to the velocity of separation.
5. Find angle of projection of a projectile for which its maximum height and horizontal range are equal.
6. A boy places a fire cracker of negligible mass in an empty can of 40 g mass. He plugs the end with a wooden block of mass 200 g. After igniting the fire cracker, he throws the can straight up. It explodes at the top of its path. If the block shoots out with a speed of 3 m/s, how fast will the can be going.
7. NUMERICAL NO. 3.5
8. EXAMPLE NO. 3.2
9. EXAMPLE NO. 3.7
10. NUMERICAL NO. 3.10
11. NUMERICAL NO. 3.11

CHAPTER NO. 4   WORK AND ENERGY.

SHORT QUESTIONS:

1. Define conservation field. Give its two examples.
2. Define work. Write its formula.
3. Differentiate between conservative and non-conservative forces. Give example.
4. Define work energy principle. Also write down its equations.
5. Define escape velocity. Write its value.
6. Differentiate between geyser and aquifer.
7. State law of conservation of energy.
8. How electrical energy can be obtained by using tides?

9. Explain the methods i) Direct combustion
10. Calculate the work done in Joule and in kilo Joules in lifting a mass of 10 kg at a steady velocity through a vertical height of 10 m.
11. A cub is dropped from a certain height, with breaks into pieces. What energy changes are involved?
12. What sort of energy is in the following: a) compressed spring b) Water in high dam
13. What is Biomass energy?
14. Write merits and demerits of solar cells.

LONG QUESTIONS:

1. Define escape velocity. Derive an expression of escape velocity and calculate its value on the Earth's surface.
2. Define absolute potential energy. Derive its mathematical expression.
3. Define gravitational field. Show that gravitational field is conservative field.
4. NUMERICAL NO. 4.3
5. NUMERICAL NO. 4.7
6. NUMERICAL NO. 4.8
7. EXAMPLE NO. 4.2
8. NUMERICAL NO. 4.4
9. EXAMPLE NO. 4.3

CHAPTER NO. 5 CIRCULAR MOTION.

SHORT QUESTIONS:

1. Define radian and find how many degrees are there in one radian?
2. Derive the relation between radian, degree and revolution.
3. What is difference between angular acceleration and centripetal acceleration?
4. Prove the relation between linear velocity and angular velocity.
5. What does a diver change its body position before diving in the pool?
6. What are real and apparent weight?
7. What is the meant by centripetal force and why it must be furnished to an object if the object is to follows a circular path.
8. What is meant by moment of inertia? Give explain its significance.
9. What is meant by angular momentum? State law of conservation of angular momentum.
10. When mud files off the tyre of a moving bicycle. In what direction does it fly?
11. Find total kinetic of rolling of mass" and radius" 'r' on horizontal smooth surface.

12. Explain how many minimum numbers of geostationary satellites are required for global coverage of T.V. transmission.
13. What is meant by INTEL SAT, At what frequency INTEL SAT VI operates.
14. Show that S = r theta
15. Why Einstein views of gravitation are preferred than Newton's view of gravitation explain.
16. Calculate the critical velocity of satellite orbiting near earth's surface. (R= 6.4×10^{8} m
17. A disc without slipping rolling down a hill of ripe 10 m. If the disc starts from rest at the top of the bill. What is the speed at the bottom?
18. Define Radian and degree and what the relation between them is.
19. Define geo-synchronous satellite and what its height above the earth is.

LONG QUESTIONS:

1. Explain Rotational kinetic energy. Find rotational kinetic energy of a disc and hoop.
2. What are geostationary satellites? Derive the relation/expression for radius of geostationary orbit.
3. NUMERICAL NO. 5.6
4. NUMERICAL NO. 5.3
5. NUMERICAL NO. 5.10

CHAPTER NO. 6. FLUID DYNAMICS.

SHORT QUESTIONS:

1. Define terminal velocity. Write its formula.
2. How a dynamic lift is produced in an aero plane.
3. Derive venture relation.
4. Why fog droplets appears to be suspended in air.
5. What do you mean by famine flow and turbulent flow?
6. How row boats moving parallel in the same direction are pulled towards each other explain.
7. Explain, how the swing is produced in a fast moving cricket/tennis ball?
8. State and explain equation of continuity.
9. Water flow through a hose whose internal diameter is 1 cm at a speed of 1 ms-1. What should be the diameter of nozzle if the water is to emerge at 21 ms-1
10. Define viscosity and drag force.
11. What do you mean by laminar flow and turbulent flow?

12. Explain the working of a carburetor of a motor car using Bernoulli's principle.
13. Two bots moving parallel in the same direction are pulled towards each other. Explain.
14. Write values of systolic and diastolic blood pressure for a normal healthy mass.
15. How a chimney works best.

LONG QUESTIONS:

1. State Bernoulli's theorem. Also derive Bernoulli's equation.
2. An airplane wing is designed so that the speed of the air across the top of the wing is 450 ms-1 the speed of air below the wing is 410 ms-1. What is the pressure difference between the top and bottom of the wings? Density of air = 1.29 kgm^{-1}
3. What gauge pressure is required in the city mains for a stream from a fire hose connected to the mains to reach a vertical height of 15 m?
4. NUMERICAL NO. 6.1

CHAPTER NO. 7 OSCILLATIONS.

SHORT QUESTIONS:

1. Show that is simple harmonic motion, the acceleration is zero when the velocity is greatest and the velocity is zero when the acceleration is greatest.
2. What is meant by free and forced oscillations?
3. Define simple harmonic oscillator and driven harmonic oscillator?
4. Describe two common phenomena in which resonance plays an important role.
5. What happens to the period of a simple pendulum if its length is doubled? What happens if the suspended mass is doubled?
6. Does period depend on amplitude of vibrating body? Explain.
7. At which position the velocity of a simple harmonic oscillator is maximum and minimum?
8. How displacement and amplitude are related for mass spring system.
9. Prove that $\varpi = \sqrt{\frac{k}{m}}$ for mass spring system.
10. A man spring system is vibrating with aptitude 10 cm. Find its K.E. and P.E. Equilibrium positions when spring constant is 20 Nm-1.

LONG QUESTIONS:

1. Prove that total energy of amass spring system remains constant.

2. What is simple pendulum? Show that the motion of simple pendulum is simple harmonic motion. Also calculate the time period of the simple pendulum.
3. NUMERICAL NO. 7.1
4. NUMERICAL NO. 7.3
5. NUMERICAL NO. 7.4
6. NUMERICAL NO. 7.5

CHAPTER NO. 8 WAVES

SHORT QUESTIONS:

1. Explain the terms crest, trough, node and antinode.
2. As a result of distant explosion, an observer senses a ground tremor and then hears the explosion.
3. How are beats useful in tuning a musical instrument?
4. What does transverse wave reflecting from a denser medium undergo a phase change of 180 ^{o}?
5. Astronomers use the Doppler Effect to calculate the speed of distance stars. How?
6. Describe the use of beats in tuning musical instruments.
7. What is the affect on phase of a wave when it is reflected from a boundary?
8. What are the factors upon which speed of sound in air depends?
9. What is the difference between open and closed organ pipe?
10. What does sound travel factor in solids than in gases?
11. What is the effect of temperature be speed of sound in gas?
12.

LONG QUESTIONS:

1. Show that $v_t = v_e + 0.61t$
2. Derive Newton's formula for the speed of sound in air and describe the correction by Laplace in it.
3. Describe the transvers stationary waves in a stretched string. Show that the frequencies of stretched string are quantized.
4. Define Doppler's effect, Derive apparent frequency if.
   a) Observer moves towards the stationary source
   b) Observer moves away from the stationary source.
5. NUMERICAL NO. 8.5
6. NUMERICAL NO. 8.6

CHAPTER NO. 9 PHYSICAL OPTICS

SHORT QUESTIONS:

1. Define wave front and a ray of light.
2. State Huygens's Principle.
3. Describe the construction of Michelson's interferometer with the help of diagram.
4. What is the difference between interference and diffraction of light waves?
5. Can visible light produce interference fringes? Explain
6. Explain whether the Young's experiment is an experiment for studying interference or diffraction effects of light.
7. Could you obtain Newton's rings with transmitted light? If yes, would the patterns be different from that obtained with reflected light.
8. Under what conditions two or more sources of light behave as coherent sources.
9. Why are Polaroid sunglasses better than ordinary sunglasses?
10. How would you distinguish between plane polarized and un-polarized light?
11. What aspect of nature of light is proved by phenomena of polarization?
12. What is Braggs Law? Write down its equation.
13. 5000 lines per cm has been ruled on a diffraction grating. Find its grating element.

<u>LONG QUESTIONS:</u>

1. Discuss in detail the Young's double slit experiment to study the interference of light.
2. NUMERICAL NO. 9.7